Name: Date:

Polynomial Factoring solution (version 608)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 37 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(37)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 148}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-48}}{2}$$

$$x = \frac{-10 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{-10 \pm 4\sqrt{3}\,i}{2}$$

$$x = -5 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 5i$ and $8 - 2i$ in standard form $(a + bi)$.**

Solution

$$(7 + 5i) \cdot (8 - 2i)$$

$$56 - 14i + 40i - 10i^2$$

$$56 - 14i + 40i + 10$$

$$56 + 10 - 14i + 40i$$

$$66 + 26i$$

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3. **Write function $f(x) = x^3 - 5x^2 - 2x + 24$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	-5	-2	24
4		4	-4	-24
	1	-1	-6	0

$$f(x) = (x-4)(x^2 - x - 6)$$

$$f(x) = (x-4)(x-3)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5) \cdot (x+2)^2 \cdot (x-2)^2$$

Sketch a graph of polynomial $y = p(x)$.